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THE FEBRUARY NUMBER

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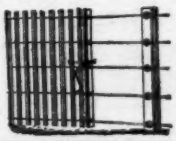

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Garden and Forest.

Among the contents of next week's issue (No. 155) will be the following articles:

Recent Botanical Discoveries in China.
By W. BOTTING HEMSLEY.

The "Elysée," Musée des monuments frangais, Paris. (Illustrated.)
By MRS. S. VAN RENSSELAER.

Clethra alnifolia, var. tomentosa.
By PROFESSOR SARGENT.

Insect Enemies of the Pitch Pine.
By MRS. MARY TREAT.

The paper will contain a view in the Elysée, after Lenoir, and a figure of Clethra alnifolia, var. tomentosa, from a drawing by Mr. C. E. Faxon.

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The Adirondack Reservation.

THE meeting held in the Museum of Natural History ten days ago at the call of the State Forestry Association surpassed in numbers and earnestness any similar gathering heretofore held in this city or state. This evidence of a strong and growing popular sentiment is gratifying, because it is the only power which can compel appropriate forest-legislation or enforce forest-laws after they are enacted. The people are slowly learning that they have in their forests a possession of inestimable value, and they are awakening to the truth that their preservation is essential to the national well-being. They are beginning to realize, too, what all experience has proved, that forests in private hands are certain to deteriorate even in countries where their value is recognized, where the proper methods of managing them are understood and where men schooled and skilled in the practice of forestry can be secured to take charge of them. If the remnant of the North Woods which still stands is to continue to do the beneficent work of preserving the streams that flow out of them, and ministering to the health, comfort and prosperity of our citizens, the state must ultimately take charge of them. The state, with its continuous life, its comprehensive concern for the good of all, its ample capital, its purpose which can be held steady from generation to generation, can alone be trusted to administer this property to the highest advantage of the community.

But how and when, and within what limits, the state shall acquire the fee of these forests, are questions of expediency which need ample discussion. The State Commission have prepared one or more bills for the establishment of a park, which we have not seen at this writing. The State Forestry Association are preparing other bills. Certain clubs are advocating still further legislation. It is not intended here to examine these proposed measures or to pass judgment on any of their provisions, but simply to say that in many particulars these provisions clash, and they cannot all be right. Whether the state is to buy the entire tract at once and outright, or to invite clubs and individual owners to retain their proprietorship under such conditions of management as it provides for its own forests; whether it is to buy land and leave the privilege of cutting timber to lumbermen or to work the woods itself and make the profit on its forest-products offset the interest on the bonds issued for the purchase of the park; whether railroads are to be stringently prohibited from entering the reservation or admitted under restrictions; all these and a hundred more questions must be faced. Meanwhile, as the demand for the park grows stronger, the owners are raising prices, and a million dollars of purchase-money will buy only a tithe of the land it would have bought twenty years ago.

Some manifestations at Albany are not such as to encourage the hope that an immediate or satisfactory adjustment of these important matters is probable. The State Commission has been charged with inefficiency and with subordinating public interests to personal ends. On the other hand, the Governor, who appointed the Commission, is said to be plotting to undermine its influence for political purposes. Let us hope that both charges will be proved baseless. But, while there is investigation and recrimination, confidence languishes. Before great sums of money are appropriated there should be absolute faith in the integrity, the public spirit and the business capacity of the agents who are to use it. It is a good time now for the people of the state to let their representatives know that they are expected to give their best thought to these problems and make some genuine progress, even if it is slow. If but few steps are taken, let them be made in the right direction—steps which will not need to be retraced.

One thing, at least, our legislators should bear in mind. The state should show itself competent to take care of the lands it already possesses while it is preparing to acquire more. Not another week should be allowed to pass without the enactment of a measure to prohibit the construction of any railroad across the state lands. The building of any dam which may cause the overflowing of state land should be forbidden with equal promptness. When these laws are passed and more stringent measures are taken against fires and trespasses upon its own lands, the state can ask with greater assurance for the enlargement of its property.

OF the extravagant methods which prevail in the United States none certainly exceeds in extravagance that under which the turpentine industry of the south is conducted; and there is no business connected with the products of the soil which yields so little return in proportion to the destruction of material involved. Mr. W. G. Cooper, in discussing in a recent issue of the *Southern Lumberman* the forest-wealth of the state of Georgia, calls attention again in a forcible manner to the lamentable results which have always followed the manufacture of turpentine in this country. The Pine-forests of Georgia once represented fabulous wealth; they were not surpassed by those of any other region, and could they have been wisely husbanded would have made Georgia one of the richest states in the Union. Mr. Cooper estimates that of the $400,000,000 worth of pine now standing in them, forty per cent., or $160,000,000 worth, have been killed by the turpentine-farmers, as the men are called who tap the Pine-trees. There are, it is said, stills enough in operation in the state to use up the remainder of the timber in seven years; and yet all that is paid for the privilege of destroying the value of the trees is seventy-five cents to a dollar an acre, or $5,000,000 for the destruction of forests which in fifteen years of good management might, it is safe to say, produce $150,000,000 worth of lumber and naval stores without seriously diminishing their productiveness. The men who carry on the turpentine industry do more damage than the lumbermen. The latter leave small trees, generally all those which do not measure ten inches across on the stump. The turpentine-farmers, however, take every-

thing they see, big and little, and once the resinous surface of the tree is exposed, fire is almost certain to finish the damage the axe of the turpentine-farmer has commenced.

It appears from a recent investigation made of the area and condition of the Georgia Pine-forests that 266 turpentine stills are in operation in the state. The farms necessary to supply one still will use up 15,000 acres of timber in three years, and it is believed, at the present rate of operation, that the Georgia Pine-forests would be ruined in twelve years even if a single acre had not already been boxed. But as four-tenths of the trees have been boxed, seven years, at the present rate the destruction is going on, will steal away, Mr. Cooper believes, the life of every Pine-tree in Georgia. It is only necessary to examine the condition of the Pine-forests in eastern North Carolina, where the turpentine industry was first established and has thus been longest practiced, to realize the effect it has on our forests, and the soundness of Mr. Cooper's views. Wilmington, which was once the most important shipping-point in the world for naval stores and the principal shipping-point for southern hard pine, has now lost entirely its commercial importance as a point of distribution for forest-products, the North Carolina Pine-forests being no longer a considerable or even an important factor in the country's supply.

The erection of the Battle Monument to be placed at West Point near the verge of the beautiful bluff whence one looks northward upon the river, has been entrusted to Messrs. McKim, Mead & White, of this city, after a competition, in which the judges were Mr. R. M. Hunt, of New York, and Mr. Arthur Rotch, of Boston, architects, and Mr. St. Gaudens, sculptor. Messrs. McKim, Mead & White, in the memorandum presented with their drawing, said:

"In preparing the design, we have most carefully considered the object of the monument and the site which it is to occupy.

"We believe the monument should be first and foremost a martial one, distinctive in its character and impressive in its design. The beauty of its site and the surroundings seem to us to preclude any bulky or massive treatment, and to suggest rather a treatment where the impression should be produced by height supported by a base which should not interfere with graceful and artistic treatment. For this reason, we have adopted as the feature of our design a single monolithic shaft treated in the shape of a memorial column or column of victory. This form seems to us to be more distinctively martial than any other, and in this form we believe it is possible to obtain impressiveness and dignity without a sacrifice of grace, at the same time preserving a distinctively architectural and monumental character. We lay great stress upon these two points—namely, the necessity of giving the monument a martial character and the relation of the monument to its site. In our design we have had these two points continually in mind with results which you must judge. The shaft is a monolith of polished granite forty-six feet high and five feet six inches in diameter. To the best of our belief it would be the largest polished shaft in the world. It is proposed to surmount it with a figure of Victory and surround it by eagles—a distinct mark of its national character. The shaft rests upon a circular base surrounded by flights of steps, giving the greatest dignity possible to the base. The materials are the most enduring—granite and bronze.

"The estimate for the cost of the monument assumes an expenditure of $50,000 in addition to the value—$5,000—of certain bronze cannon donated for the purpose by the Goverment. It is hoped that the monument will be completed during the course of the coming summer."

The other competitors were Messrs. Babb, Cook & Willard, of New York, whose design showed a Doric column of polished granite, surmounted by a bronze figure, and set upon a raised platform with exedras on two opposite sides; Mr. W. R. Emerson, of Boston, who proposed a triumphal arch of white marble, flanked by a colonnade, and resting on a platform; and Messrs. Carrère & Hastings, of New York, who again proposed a columnar shaft. Their memorandum said (and the point they raise is worth noting in view of the very lofty proportions of the column designed by Messrs. McKim, Mead & White): "In our opinion, on the site chosen, with no background other than the sky and distant scenery, whatever the character of the monument may be, its seeming proportions will so change—apparently lessening in diameter without lowering in height—that it will need some kind of decorative background between it and the landscape. Moreover, while the height of a classic column of such an order as we have studied, if introduced into a building, should be equal to nine diameters, we are persuaded that, standing by itself, it should have seven and a half diameters, and this fact is illustrated in many examples, conspicuously in the Column of Trajan, in Rome, and in the Columns Vendome and La Bastille, in Paris. To illustrate further the principle of having something between the monument and the landscape: a monument in a public square, amid buildings or other surroundings, reveals its true proportions and looks better than it would in a large park. We have, therefore, suggested a decorative colonnade as shown on plans. The shafts of the columns and piers, as also the friezes of this colonnade, would give the space asked for in the programme, to receive the names of the officers and non-commissioned officers who fell in the war."

Dahlias in Mexico.

HEEDING the suggestion of an English botanist, I gave, on my latest journey in Mexico, the home of the Dahlia, special attention to this genus, and for the effort was well rewarded as usual. Two new species were brought to light to be added to the half-dozen already known and in the hands of cultivators. These are *Dahlia pubescens* and *D. dissecta* of Watson.

D. pubescens was found on calcareous bluffs of prairies bordering the valleys of small streams in the state of Mexico and to the north of Toluca. The plant struck me at first sight as very distinct in habit from the species I had frequently encountered, the parents of most of our garden varieties; for it is smaller, only one and a half to two feet high, and more strict, the leaves, pinnately parted with narrower and more numerous divisions, being, like the fewer branches, more erect. This strict appearance is further increased by the flowers being held vertically by erect peduncles. The flowers are two or three inches broad, with a yellow disc surrounded by about eight rays, which are purple, with lines of deeper color, but change with age to light purple or dull rose. The tubers are comparatively small, only one or two inches in length, and vary from round to oblong in shape.

D. dissecta was discovered growing on limestone ledges of mountains fifty miles east from San Luis Potosi. It is a very unique species, being scarcely more than two feet high and of bushy habit from an almost woody base. Its leaves are bipinnate, sometimes tripinnate, with numerous divisions only one or two lines wide, smooth, dark green and somewhat fleshy. The flowers are raised above the foliage on peduncles a foot long; they are two or three inches broad with about eight mauve-colored rays. All my breaking up of the rocks, in whose seams the roots of this plant were hidden, failed to bring to view any tubers; doubtless, it is only to be propagated by seed and by division of the perennial branching base, from which arise the very leafy annual flowering branches. Owing to its peculiar habitat this must be a very local species.

Working southward from the boundary slowly and somewhat carefully, I have as yet only reached the latitude of the capital at various points within the states of Mexico, Michoacan and Jalisco; hence I have so far met with only two of the old species of Dahlia, *D. coccinea* and *D. variabilis*, those earliest known and most varied and combined under cultivation.

Of these *D. coccinea* has the more northerly and by far the most extensive distribution. From the Cordilleras of Chihuahua, within 200 miles of the United States Boundary—probably much nearer, and possibly within the limits of the United States on the Chiricahua Mountains of Arizona—it ranges southward through the mountains to Jalisco in a purple flowered variety, and was seen again in the adjoining state of Michoacan in a yellow variety. On the eastern side of the country, also, it was found from the mountains of Coahuila to those surrounding the Valley of Mexico. On this line the colors shown were scarlet varying through orange to lemon yellow. The size of its flowers in the wild state varies from two to three or four inches in breadth, and the stature of the plant from three to six feet or more. Its habitat has been given as "sandy meadows" (probably the alluviums of streams was meant), but I have rarely seen it growing except in the thin, dry soil of ledges—even in the crevices of bare ledges—or (quite commonly) among the broken rocks which form, with a little soil, the talus of cliffs, either mountain walls or cañon walls. A sight of its bright flowers is cheering to the

collector when he is struggling with the difficulties of such situations as these.

D. variabilis was not met with until I had reached the state of Mexico. On the sides of ravines among the foot-hills of the mountains that rim the Valley of Mexico it was seen in abundance and perfection, a royal plant, coloring the slopes with its profuse purple blooms. Many of the flowers measured five inches in breadth. The height of the plants varied from three to six or eight feet. Near by, but far less abundant, *D. coccinea* was growing on the bluffs of streams, the plants here showing the largest development. It added interest to these two plants, as I admired them, to reflect that it was from this vicinity, quite likely, that seed was obtained a little before 1789 to send to the Botanic Garden of Madrid, and again in 1804 by Humboldt. Amidst the enterprise of the present century it seems incomprehensible that the Spaniard, who admires all things that are beautiful, should have been in Mexico 270 years before sending home plants so striking as these.

Walking among these wild Dahlias day by day, admiring the symmetry of their single flowers and the rich contrasts of scarlet and gold displayed by the disc and rays of the one, and of purple and gold shown by the other, the aversion which the botanist feels for the monstrous forms of flowers produced in gardens was intensified in me; and it was with much satisfaction that I learned afterward that single Dahlias are now receiving far more attention among cultivators than double ones. As yet, however, it is only the older double sorts that are seen in Mexican gardens.

After improving this large opportunity to study these two species in their wild state—and probably these are the two most closely related of all which botanists have recognized—I marveled at the audacity shown by the late Mr. Shirley Hibberd when he declared at the Dahlia Show held at Chiswick last autumn that, in his opinion, there was no good ground for admitting more than one original species. If he should be able to refer *D. coccinea* to *D. variabilis*, could he so dispose of such extreme species as *D. imperialis* or *D. scapigera*, not to mention this new *D. dissecta?*

Charlotte, Vt. *C. G. Pringle.*

Plant Notes.

Prunus ilicifolia, var. occidentalis.

THE relegation of the plant to its proper place seems to have been attended with some difficulty, and as regards the authority for the name under which it first appears there has also been more or less question by botanists who have lately noticed the species. So far as I know, Mr. W. S. Lyon published the first account of the plant in the *Botanical Gazette* (xi., 202, 333) in 1886, referring it to *Prunus occidentalis* of Nuttall, a name which cannot be found, and very probably was never used by Nuttall, and if at all, as Professor Greene has fitly remarked, Nuttall would more likely have used it under Cerasus, holding, as he did, the sections of Prunus, as now understood, to be separate genera.

Professor Greene gives the next account of this plant in his "Notes on the Botany of Santa Cruz Island" (*Bull. Cal. Acad. Sc.*, ii., 7,395, 1887) under *Prunus occidentalis*, and failing, as others have, to find that the name was of Nuttall, properly cites Lyon as the authority.

The next mention is by Mr. T. S. Brandegee in his "Flora of the Santa Barbara Islands" (*Proc. Cal. Acad. Sc.*, ser. 2, i., 2,209, 1889), where it appears as *Prunus ilicifolia*, Walp., var. *occidentalis* (Lyon) (=*P. occidentalis*, Lyon). Professor Sargent (GARDEN AND FOREST, ii., 400) approves the disposition of the plant in relating it to *Prunus ilicifolia*, and advises that Mr. Brandegee's name be taken up, although very properly adding that *occidentalis* is nevertheless unfortunate, in view of the West Indian species, which bears the same name.

It appears now, however, that the term *occidentalis* is no longer tenable in its application to this plant, either in the rank of species or variety, as, in 1800, Swartz applied it to a West Indian species of this genus ("Fl. Ind. Occ.," ii., 925), a fact which should preclude its further use in the case of our California insular variety, and hence leaves this plant without a name.

I have thought best, therefore, to designate this variety as *Prunus ilicifolia*, var. *integrifolia*.

The following characterization of this variety is drawn chiefly from Professor Greene's remarks (*l. c.*) under *Prunus occidentalis*, Lyon:

Leaves evergreen, glossy, three to four inches long, two to two and a half inches broad; mostly ovate-acuminate, rarely lanceolate-acuminate, and three inches long by three-fourths of an inch broad, sometimes broadly ovate and abruptly acute, with spinose-serrate margins, usually entire or remotely denticulate. Inflorescence racemose, flowers white. Fruit dark red-purple, orbicular, three-fourths of an inch in broadest diameter, slightly compressed laterally and with a well-marked suture on one side; pulp thin, sweet, with bitter almond flavor. Fifteen to twenty-five feet high, bark rough and dark colored, crown compact and well rounded.

As occurring on Santa Cruz Island it is described as resembling a large bush with several trunks from the same root; while on Santa Rosa a single trunk sometimes reaches a height of fifteen feet before branching. Mr. Brandegee mentions a large tree near San Francisco with a diameter of more than two feet, and that in the Santa Inez Mountains it reaches six inches in diameter.

Professor Greene adds that the narrow-leaved form is only occasional, and that the spinose-serrate foliage belongs chiefly to young trees.

Mr. Lyon (*l. c.*) states that in parts of Santa Catalina Island this tree is characteristic and conspicuous in its beauty, occurring on the interior mountain ridges at 3,000 feet elevation, as well as in the rich valleys and cañons to the water's edge. Professor Greene reports it from Santa Cruz Island, where Mr. Brandegee examined it, as well also as on Santa Rosa, where it is confined to the bottoms of cañons.

Washington, D. C. *George B. Sudworth.*

New or Little Known Plants.

Viola ocellata.

THIS pretty Violet (Fig. 13, p. 55) is closely related to our common eastern Canada Violet (*V. Canadensis*). It is a native of California, where it is found growing under the shade of the forests of the coast ranges from the northern borders of the state to Monterey. It has the leafy stems of its eastern relative, and very much the same habit of growth, and the same cordate, pointed, serrate leaves. The petals, however, instead of being white faintly tinged with violet, as in that species, are more gaily colored. The two upper are white on the inner surface and deep purple-brown on the outer, while the others are yellow veined with purple, the two lateral with a purple spot near the base and slightly bearded on the claw.

*Viola ocellata** has been known to botanists for a long time. It has not probably, however, been often cultivated, although well worth a place in those gardens in which plants with pretty and delicate flowers are valued.

Juglans Vilmoriniana.

THE tree whose portrait appears in the illustration on page 53 was planted as a young seedling by my grandfather in his garden at Verriers, near Paris, as a memorial of the birth of his oldest son. Nothing is known of its origin. It is supposed, however, to be a hybrid between the European Walnut and the American Black Walnut. Such, at least, was the opinion of the late Dr. Engelmann, and his conclusion seems fully sustained by an examination of the characters of the tree. The branches are more upright than those of the European Walnut. The bark of the trunk is grayish, with regular vertical rather remote furrows; that of the two to four-year-old branchlets is dark brown and smooth, the young shoots being slightly pubescent near the buds, and the color of Florentine bronze. The buds are enclosed in brown, somewhat fleshy, hairy scales. These characters are almost intermediate between those of the European and of the Black Walnut. The leaves and the fruit are intermediate in character, too, between the supposed parents. The leaves of *Juglans Vilmoriniana* are usually composed of five pairs and a terminal leaflet, the last being somewhat larger than the others. They are ovate, slightly coriaceous, smooth, dark green, and remain on the branches until killed by frost. On the whole, the leaves resemble those of the English Walnut, but with one or two additional pairs of leaflets and

**Viola ocellata*, Torrey & Gray "Fl. N. Am." i., 142.—Hooker & Arnott, "Bot. Beech," 325.—Brewer & Watson, "Bot. Cal.," i., 56.—Gray, *Bot. Gazette*, xi., 291.

with a slight difference in their shape. The fruit, which is not produced every year, and never in large quantities, is smooth. The shell of the nut (figured below) is thicker and more deeply furrowed than that of the European species. The fruit germinates well and produces plants resembling the parent. The original tree has grown very

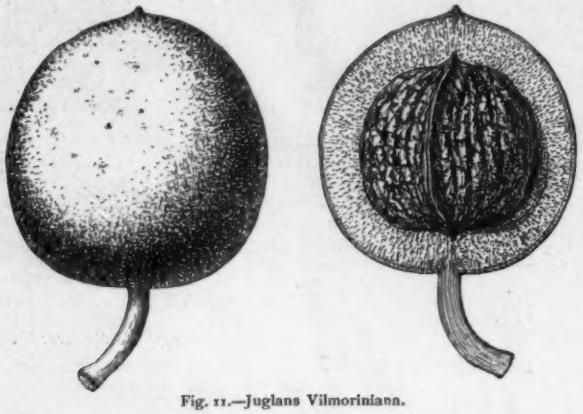

Fig. 11.—Juglans Vilmoriniana.

fast, and, although not more than seventy-three or seventy-five years old, is now seventy-five to eighty feet high, with a trunk-diameter of forty inches three feet from the ground.

Of the few seedlings which have been raised from this tree one is growing beautifully at Segrez, in the Arboretum of Monsieur Lavallée, and produces fertile nuts. All the seedlings have grown thriftily when planted in deep sandy soil mixed with clay.

Is it to be supposed that the fine tree at Verriers is the first-born of its race? So it would appear from the fact that no older specimen is known. Is it probable, however, that the planter would have selected a tree to commemorate an important event in the family history, and to occupy a specially favorable location, unless he had some idea of what it would become in time? Were its peculiarities and value known to him? To this there is no clue. It is not, however, customary in France to plant the European Walnut as an ornamental tree in parks and gardens, and it is more probable that this particular tree was planted for a Black Walnut and selected from a lot of seedlings as being larger and stouter than the rest, a chance cross having caused these conditions. This, perhaps, is the least improbable hypothesis of the origin of *J. Vilmoriniana.*

Paris. *M. L. de Vilmorin.*

Foreign Correspondence.

London Letter.

Hollyhocks.—These noble border plants are attracting considerable attention amongst English cultivators. Mr. Douglas' interesting paper upon them, read before the Royal Horticultural Society in August last, and noticed in Garden and Forest in September (p. 454), drew public attention to them, and a paper on the best varieties by Mr. George Steel in this week's *Journal of Horticulture* is certain to do much toward creating a reaction in England in favor of the Hollyhock as a garden plant.

Twenty years ago the Hollyhock was as popular as the Dahlia is now, and it was not until the appearance of the destructive Fungus (*Puccinia malvacearum*), which destroyed many collections, and appeared to make the cultivation of the Hollyhock almost hopeless, that the plants lost favor. A prospect of overcoming the attacks of this pest by means of various simple remedies, such as soot, lime, Condy's Fluid and weak solutions of sulphate of potash, makes it less formidable to growers than it was a few years ago, and next year will probably see the Hollyhock reinstated among the most popular of summer-flowering plants.

Mr. Steel has been to considerable pains in obtaining, by means of a sort of census among Hollyhock fanciers, a return of the best kinds now in cultivation. Altogether he has no less than 400 named varieties recorded. Of this number, however, only fifty-two are included in his select list, from which I take the first dozen, placed in their order of merit as shown by the returns:

Grace Darling (rosy salmon), Robert Ryle (carmine-red), Maggie Bain (rosy peach), F. G. Dougall (rosy purple), Le Grand (salmon-flesh), John Findlay (vivid crimson), Lord Decies (dark crimson), Mrs. G. Steel (peach, shaded rosy salmon), Agnes Ryle (yellow, stained carmine), Perfection (silvery flesh), Queen of Yellows (bright yellow), Alba superba (pure white).

While many of the florists' ideal varieties of Hollyhock are such as would be admired by the less-exacting horticulturists, I may say a word in praise of common seedling single-flowered kinds. In a garden attached to my house there has been for the last three years a large clump of a single-flowered, rose-colored kind which pushes up annually at least a dozen stems, each about seven feet high, and for at least half their length clothed with flowers. This clump gets no special treatment, yet it grows vigorously and knows nothing of the fatal Puccinia. No doubt the highly bred kinds are exceedingly delicate. They are all the progeny of one species, namely, *Althæa rosea*, a native of Asia Minor.

Phrynium variegatum.—Writing to the *Gardeners' Chronicle*, Mr. Ridley, Director of the Botanic Gardens, Singapore, states that this plant, which M. Linden distributed a few years ago under the above name, has long been in cultivation in Singapore, where it is known as *Maranta arundinacea variegata*, or the variegated Arrowroot. It was obtained by M. Linden's collector from the Singapore Botanic Gardens.

Crossing Chrysanthemums.—I have repeatedly read of the production of so-called hybrids from garden Chrysanthemums, but I have never yet seen one that could not have originated as a seedling sport, uninfluenced by any foreign pollen whatever. I see you have in America also growers who profess to be able to cross one variety with another with certainty. I wonder how it is done? Can any one take, say, Queen of England and Edwin Molyneux, and produce from them a true cross, or would not seeds from either produce all kinds of variations or sports? Mr. A. Forsyth, who was a great raiser and distributer of Chrysanthemums, said, eighteen years ago: "Permit me, in all sincerity and politeness, to say that hybridizing the Chrysanthemum is fudge. Take your seed as you get it, and with it take your chance of the crossing Nature has accomplished for your benefit, but do not suppose that any one less gifted than a magician can manipulate the flowers of the Chrysanthemum with the certainty that we operate on the flowers of the Geranium and Fuchsia." There is much talk here of "intelligent crossing," "judicious selection of the varieties to be operated upon," etc., but much of it means no more than the assurance of the raiser of hybrid Ferns that he "effected a cross by carrying the two kinds of spores mixed in his pocket."

London. *W. Watson.*

[There is much truth in this criticism, and in many cases there is no foundation for the claim that the parentage of a new Chrysanthemum is absolutely known. But this is equally true of many other hybrid and cross-bred garden plants. And yet it is not safe to assert that there can be no assurance of pedigree in given instances, even of cross-bred Chrysanthemums. A few American experts make use of devices and appliances which seem to reduce the uncertainty to a minimum. We hope to give an account of the most approved practice in this direction in an early number.—Ed.]

Cultural Department.

Experiments in Treatment of the Diseases of Plants.

The reports of experiments made in 1890 in the treatment of diseases of plants at the several stations which are directed by Professor B. T. Galloway, Chief of Division of Vegetable Pathology, United States Department of Agriculture, may not be published until late in the spring of 1891. Meanwhile a synopsis of the results of work at the Vineland, New Jersey, station may be of immediate interest.

The experiments made at Vineland were chiefly directed to comparing the values of various solutions of copper in their use as preventives of fungous disease. If it is learned which is the best of these solutions, this one can be recommended for general adoption. It is probable, however, that there is no universal remedy, and yet it is important to know

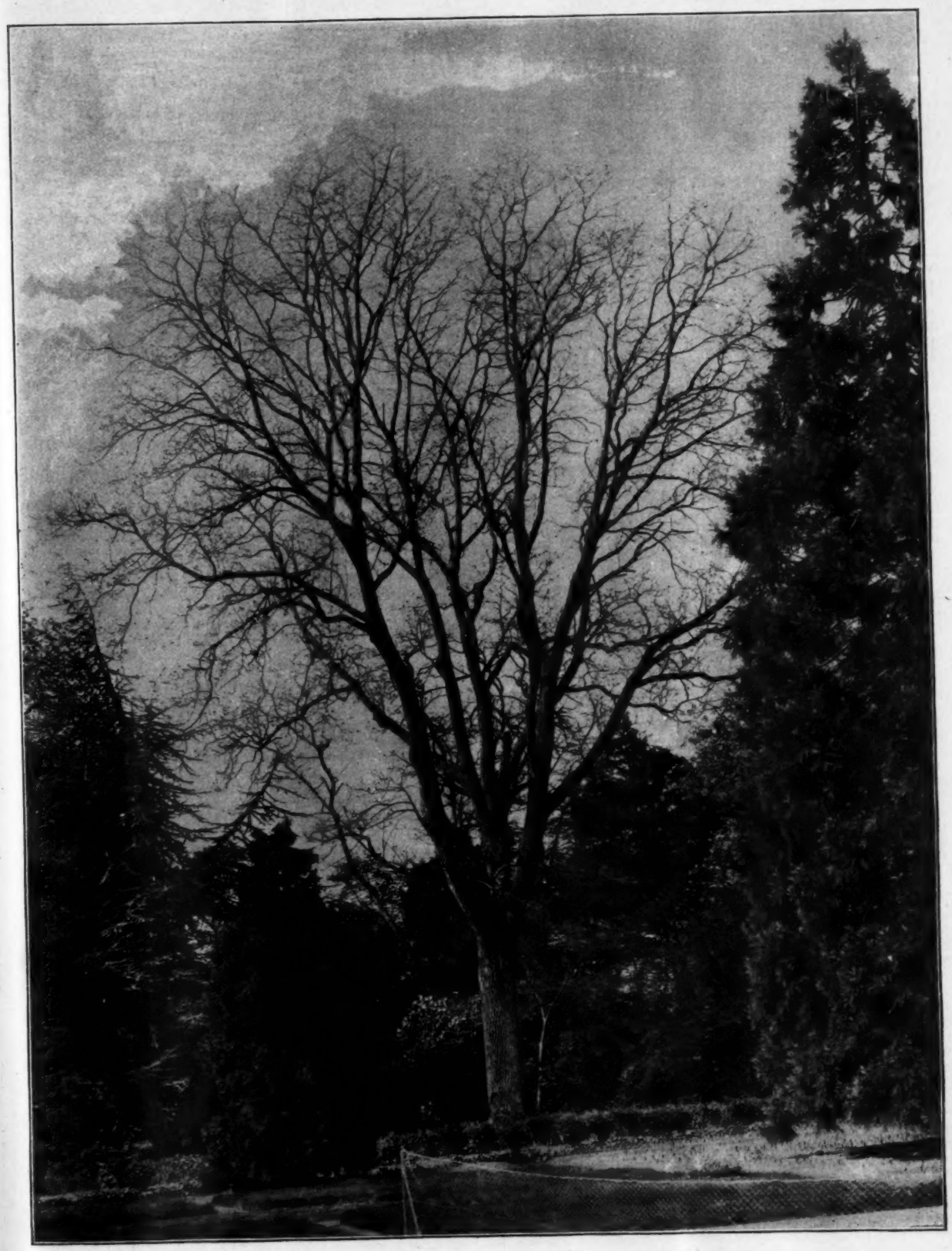

Fig. 12.—The Original Specimen of Juglans Vilmoriniana.—See page 51.

definitely the various specifics for the various plant-maladies which need to be prevented or cured. Copper is one of these specifics. It is more generally antidotal to the Fungi which cause injury to plants than any element hitherto tried. In France some years ago the discovery was accidentally made that sulphate of copper is preventive of many Fungi injurious to the Grape. This is verified by repeated experiments in the United States, and it is further learned that other preparations of copper are also fungicides. For prevention of the mildews of the Grapevine I have in 1890 tried with satisfactory results the carbonate of copper and the acetate of copper.

What is known as the Bordeaux Mixture still proves to be the most reliable preventive of the Black Rot of the Grape.

The formula of this mixture has been widely published, and should be generally known, yet I have so many letters of inquiry concerning it that it may be well to print the recipe again: Take six pounds of copper sulphate, pulverized, and dissolve it in sufficient boiling water, and six pounds of unslaked lime, dissolved in cold water. Four gallons of hot water is enough to dissolve the sulphate, and six gallons of cold water is enough to slake the lime. When the two solutions have cooled mix them, and dilute this mixture with cold water enough to make twenty-five gallons of the liquid in all. Mix well, then let the mixture rest for a few minutes, so that the coarser particles of lime may settle. Then draw off the superincumbent liquid (which will resemble milk of lime) for use in the spraying machine. When used in spray this liquid should carry with it its chemical contents—that is, the mixture must be kept stirred. The treated plant after it is sprayed with the mixture should appear as if thinly whitewashed. This whitewash after it has dried or "set" will remain on the plant quite persistently; more so on the fuzzy surface of leaves than on the smoother skin of the grape. I have seen the Bordeaux Mixture applied in June yet visible on Grape-leaves in November. The health of these leaves was thus preserved through the season. For protection of the grapes from the Black Rot the spraying should be repeated about every two weeks, according to the weather. If a heavy rain falls soon after a spraying this should be repeated as soon as possible.

The cost of spraying a vineyard is small in comparison to the value of a full crop of protected grapes. I can point to a vineyard in southern New Jersey of some thousands of Concord-vines which, sprayed every ten days, carried a sound crop of fruit full twenty pounds to the vine, while adjacent vineyards were ruined by the Black Rot. These protected grapes were worth to the owner, a wine-maker, fully six cents a pound. The cost of protecting them was about four cents a vine.

The quantity of lime for the Bordeaux Mixture was formerly put at four pounds; I suggest six pounds, to be surely on the safe side. A surplus of lime can do no harm. If there is not enough lime to decompose the copper sulphate the mixture will injure the plant. I had last June an instructive experience as to this. In the hurry of preparation of sundry casks of copper solutions, we carelessly used in making the Bordeaux Mixture only four pounds of water-slaked lime. This quantity is equivalent to scarcely two pounds of fresh lime—hardly half sufficient to neutralize the acid of the copper sulphate. With this faulty mixture I sprayed some 400 vines when they were in bloom. The next day I saw that on these vines my spraying had destroyed all the blossoms and all the foliage! This costly lesson disposes me to suggest the prudence of testing all mixtures, which may contain matters hurtful to vegetation, on a few plants before making a general application. Prepare fungicides and insecticides some days previous to the time when they are to be used and try them on a small scale until sure that they are right.

There is no danger attending the use of the ammoniacal solution of carbonate of copper. The formula for this is: Three ounces of the carbonate, two quarts of aqua ammonia (twenty-six degrees) and fifty gallons of water. The copper carbonate will soon dissolve in the ammonia, after which the solution is mixed with the water.

As a fungicide I used, in 1890, with very encouraging results, a solution of two and a half pounds of acetate of copper in twenty-five gallons of water. In prevention of potato blight and rot this is as good as the Bordeaux Mixture. I cannot judge of its efficiency against grape-rot, because that section of the vineyard subjected to the copper acetate was stripped of grapes by the Rose-beetles.

All of the solutions of copper mentioned seem sufficiently preventive of Grape-leaf mildews. Here the efficacy of the copper is complete. All of the treated vines held their foliage green and healthy until frost. The leaves of the vines not treated were destroyed by mildew by the last of August.

A solution of copper highly recommended by the Delaware Experiment Station is, to thoroughly mix in half a pail of water one pound of carbonate of copper, to which is added three ounces of common glue dissolved in hot water. Then dilute to twenty-five gallons. It is reported that this mixture had no action on the foliage, was easily prepared, and gave remarkable results at a time when the rot was making rapid progress in the vineyard where it was used.

The Delaware Station recommends also the following preparation: Mix together three ounces of carbonate of copper and one pound of pulverized carbonate of ammonia. This mixture will entirely and quickly dissolve in a couple of quarts of hot water, when it can be diluted to fifty gallons. The cost of materials for fifty gallons of this mixture is twelve cents.

As the infection of Black Rot must be prevented, but cannot be cured, it is needful that treatment of the vine must begin early in the season. In spring, before the buds swell, spray the vine thoroughly with a solution of one pound of copper sulphate in twenty gallons of water. Then, not later than the middle of May, just before the vine blooms, spray with the Bordeaux Mixture; again in ten days, and then at intervals of two weeks until about the last of July. The last two or three sprayings may be with the carbonate of ammonia and copper mixture, in order to avoid the whitewashing of the fruit consequent on late use of Bordeaux Mixture.

Contrary to the experience of others, I have not succeeded in controlling Anthracnose on a variety of Grape-vine peculiarly afflicted by it with any of the copper solutions. I fail also to find any fungicidal value in solutions of sulphate of iron.

The Pear-leaf blight (Entomosporium) and that of the Quince are fully prevented by timely sprayings with Bordeaux Mixture.

Of the copper solutions used in the summer of 1890 for prevention of Potato blight and rot, the Bordeaux Mixture and the acetate of copper give decidedly the best results. By spraying the Potato-plant every two weeks with either of these solutions it will be effectually defended against the Fungus which causes the rot. In very rainy seasons and in very wet locations it may be difficult to keep the Fungus from blighting the Potato-tops. Such was the case with me this last fall. Nevertheless, although the tops blighted before maturity, the tubers were saved from rot in those sections of the field treated with the Bordeaux Mixture and with the acetate. The rest all blighted and rotted badly.

Vineland, N. J. *A. W. Pearson.*

Plant-houses for Amateurs.—I.

EVERY one who is interested in flowers is almost certain, as winter approaches, to wish for some proper shelter for his plants. If much interested he dreads the long season of cold weather, when the plants housed in makeshift quarters will require much attention, and make little, and that unsatisfactory, growth. Window gardening, even with carefully selected plants, entails a vast amount of labor, and there are always many plants to which the atmosphere of an ordinary house heated with a furnace and lighted with gas or oil is fatal. Not every household is willing to adapt its doings to a windowful of plants. Usually, where means are at command, a greenhouse or a conservatory is soon added to the grounds of the village or country dweller who cares for flowers, and many times added simply as a fashionable luxury. But the ordinary grower of limited means hesitates at the mention of a greenhouse as involving great expense in construction and maintenance. This is an erroneous idea; for a plant-house can be erected at a very small expense, quite within ordinary means. As with most things, the necessary parts are inexpensive, and it is only by the addition of ornaments and fanciful work—luxuries—that the cost is made formidable. The horticultural papers have published article after article on small greenhouses, year after year, and yet such houses are far from common, while it would seem that a large proportion of the owners of gardens would erect such houses and enjoy them were the facts clearly understood.

My notes probably will add little to the general information, but may interest some one else who finds recreation among growing things. My small house, which faces north and south in one corner of the garden, is not without its faults—like all first attempts at building—but proves a good working house for my requirements, which are sufficient space, light and heat to winter over tender stock, to grow and flower plants and bulbs, with a space for propagation and seed pans. It also provides "the den," necessary to most men, where confusion may reign without the danger of a revolt in the household.

The house is a span roof with seven-foot ridge eighteen feet by eight feet (a width of nine or ten feet would be better, and would cost only a trifle more). It is covered with sash for fifteen feet and boarded for three feet over the furnace. The

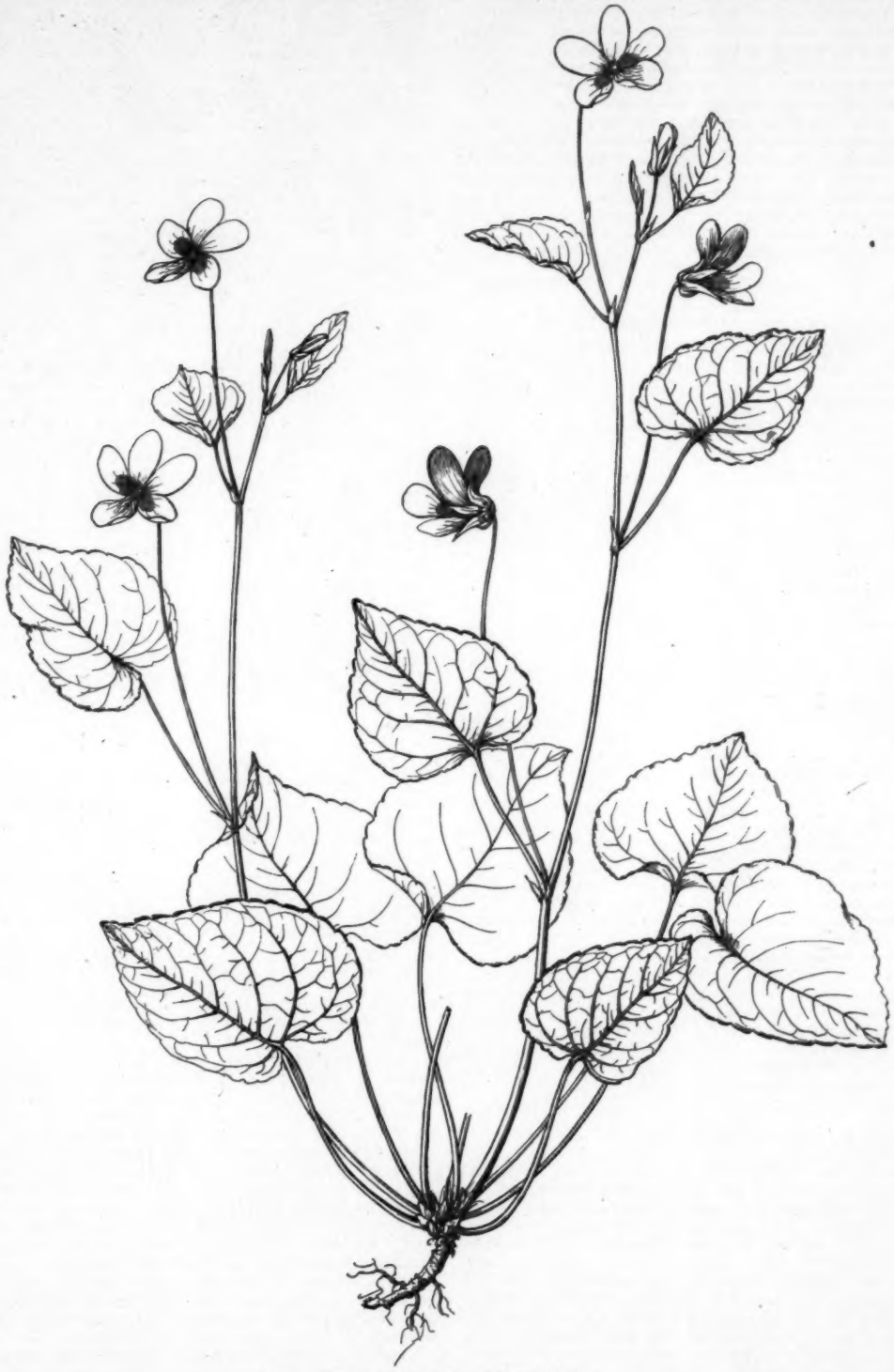

Fig. 13.—Viola ocellata.—See page 51.

lumber cost within a few cents of twenty-five dollars, the sash twenty dollars, the paint, etc., perhaps five dollars; in all fifty dollars for materials. The labor bill will depend somewhat on one's own handiness, or the activity of the builder, who will do the erecting in two or three days. The side-walls are of hemlock boards, covered with building paper, and faced with patent sheathing boards, which answer capitally to keep out cold. The heater, pipes, etc., suitable for such a house, ready for screwing together, may be had for fifty dollars cash, so that an expenditure of $100 to $110 will furnish one with a small plain house, quite large enough for an amateur gardener who is engaged during the day in other occupation. If larger,

the care is apt to become a burden sometimes, and it is much better to start with a small house and long for more space, than to have so much to water, etc., that pleasure changes to disgust. The heater is the article which gives the pause to many people desiring a greenhouse; and various arrangements are constantly recommended and said to work perfectly. The hot-water apparatus, with furnace, pipes and expansion-tank, is in general use by florists, and as it is a commercial matter with them it may be concluded that what they use is the most desirable for the purpose. The first cost is rather more than other fixtures, but a base burner gives out heat quite uniformly, will burn with slow combustion a long time without attention, and by the pipes a uniform heat is distributed through the house. Their fault seems to be that they are wasteful in radiating heat from the outer surface, as this is lost in the furnace-room. However, the stove can be jacketed and water in pipes thus kept hotter. In my case the surplus heat tempers an adjacent frame. My house has a single two-inch flow and return, and, though not at all air-tight, is rather overheated.

Elizabeth, N. J. *J. N. Gerard.*

Cypripedium venustum.

ALTHOUGH by no means a large-flowered species, *Cypripedium venustum* is an object of much attraction during the winter months. From December until February, and even later, this pretty Lady's Slipper will be met with in flower, occupying a prominent place in the Orchid-house as much on account of its beautifully marbled foliage as for its flowers. The latter appear generally singly on an erect scape, six to nine inches high, but it is not unusual to see two flowers on one scape. The white upper sepal is broadly cordate-acute and conspicuously striped with bright green, while the much smaller lower sepal is pale green, with darker green veins. The bearded petals are dark green at the base, with some blackish purple spots near the edges, and the apical portion is dullish purple, the entire length being traversed with dark green veins. The lip reminds one very much of an inverted helmet; it is small, yellowish green, but nicely netted with dark green veins, and sometimes washed with purple, while the basal incurved lobes are of a shining tawny yellow, with numerous small spots or warts. Great variation exists among the flowers as regards coloring, some forms being much more highly colored than others, owing no doubt either to geographical or cultural differences. The two varieties known in gardens as Pardinum and Spectabile are, however, the most distinct, and may always be recognized by deep coloring and beautiful markings on the lip.

The discovery of *C. venustum* is due to the well-known Indian botanist, Dr. Wallich, who met with it in north-eastern India, and had plants sent to be cultivated in the botanic gardens at Calcutta. About 1819 plants were obtained from the botanic garden and introduced to England, where it met with a favorable reception. Since this time it has been imported in quantity on several occasions by enterprising nurserymen, whose chief desire, however, is not so much for the typical plant as for its more attractive varieties.

The cultivation of this species is very easy. An intermediate house, with a temperature varying from fifty-five to sixty degrees Fahrenheit in winter to sixty to seventy degrees in summer, will suit it admirably, with plenty of light. The compost should consist of rough peat and sphagnum moss, and during the period of growth water may be given in liberal quantities, but at other times must be given sparingly.

Isleworth, London. *John Weathers.*

Color in Conifers.

IT is noticeable that the public interest in the multiplied varieties of conifers has greatly increased within a few years past. Especially has this been true in the case of the Silver Firs and Spruces. At the present time there is a large demand for the light colors of *Abies concolor* and *Picea pungens* to contrast with the darker shades of *Abies Nordmanniana* and similar kinds. Nor is this in any way surprising when we consider the striking effects which are produced by grouping trees of differing shades of color, which retain their beauty throughout the year. To one unfamiliar with these conifers it will be a revelation to witness how completely a winter landscape, even in our northern latitude, may be transformed into a garden of color.

But it is objected that in the case of some of the kinds most desirable on account of color, this characteristic is lost as the tree attains age. At a recent discussion before the Massachusetts Horticultural Society the opinion was expressed that *Picea pungens* would soon lose its popularity, because of the unreliability of its color even with the best selected trees. The fact was stated that in its home on the mountains the forests of this Spruce have lost the silvery sheen of young trees. This is not the case with *Abies concolor*, which retains its glistening gray foliage even to old age. But we must not be hasty in our judgment of *Picea pungens*. In the first place, it is to be considered that to a great degree the beauty in color and form of many conifers is confined to their youth and middle age. Stately specimens of mature age are, indeed, magnificent. But we may well be satisfied if we can secure results which will continue for twenty-five or perhaps for fifty years.

And again, I think there are numerous indications that this quality of color is to a considerable extent within our control. An observer who has visited the forests of northern New England, especially on the coast of Maine, will have noticed the fine color of our native White Spruce. It delights in a cool, moist climate. The Balsam Fir is also at its best in such localities. In a hot and full exposure these trees lose this distinctive coloring. I have had young seedlings of *P. pungens* planted in a warm, sunny place, which became almost without exception of a uniform green. It was very apparent that the position was too hot and too sunny and the soil too sandy for them to develop the glaucous color. A marked improvement has been noticed upon transplanting them to a cooler western slope and into a good loamy soil. So many instances have been observed that I think we may lay down the rule that rich color depends largely upon culture. It is well known that Rivers' Purple Beech, when it is a large tree, requires feeding. Left to an impoverished soil its foliage becomes a dull bronzy green. But a generous feeding will restore it to its early color. The same principle applies to conifers. It is a fact that where well-rotted manures have been applied the colors have been restored. The secret of the remarkably distinct color of some notable trees near Boston is from the fact that they have an abundant supply of compost or cow-manure. Specimens of *P. pungens* twenty-five or thirty feet high are of the richest shining silver and show no signs of change. Give the tree good treatment and it will retain its beauty for years.

And it may be added that the luxuriant effect of conifers is surprisingly enhanced by a judicious application of fertilizers. It is an exploded idea that evergreens will not bear feeding.

Waban, Mass. *William C. Strong.*

Some Useful Acanthads.

ERANTHEMUM PULCHELLUM.—Those who grow a mixed collection of plants would find this free-flowering species very serviceable in winter. It is not common in cultivation, though known since 1796, when it was introduced from the East Indies. It branches freely, but is, nevertheless, of compact habit. The opposite leaves of deep green are elliptical, pointed at the extremity, and narrowed at the base to a short petiole. The flowers are borne in short terminal and axillary spikes. The tube is narrow and an inch in length; the limb an inch in diameter, spreading abruptly, and divided into five oval segments of bright blue color. The calyx divisions are white, insignificant, and covered by the conspicuous bracts, variegated green and white. Blue flowers are nearly always scarce in greenhouses, and it is, therefore, desirable that a plant which produces them abundantly in winter should be known to every one.

PERISTROPHE SPECIOSA.—In a warm greenhouse this plant is extremely prolific of its pretty flowers during the winter and early spring months. It is a native of the East Indies, and was introduced to the notice of gardeners in 1826. The plant is of an erect, free-branching character, with opposite, ovate-acuminate, pale green leaves. The flowers proceed singly or in pairs from the axils of the leaves which clothe the little branches at the top. The narrow twisted tube is about an inch in length, and the limb consists of two broad but slightly shorter segments, one of which is thrown backward, while the other opposite protrudes or droops slightly. A reddish purple color prevails, and the upper segment of the limb is spotted with dark purple at the base. It is a very attractive plant. *Justicia speciosa*, though now considered generically erroneous, is a much commoner name for this species.

STROBILANTHES ISOPHYLLUS.—Although deficient of the showiness which characterizes the subjects generally grown by florists, this plant deserves notice as one worthy of a prominent place in those private gardens where easy contrasts of color give more satisfaction than glaring effects. It was introduced from Sylhet in 1845. But the nurserymen have never given it much attention, and thus the plant is seldom met with

in any but botanical gardens. Those who visit such institutions during its flowering season agree in praising it, and they usually note the name with the intention of securing a specimen. But the venders of plants seldom keep it, and the search for it ends with the first disappointment. It is a plant of neat, bushy growth, with dark green lanceolate leaves. The bell-shaped flowers are over an inch in length and three-fourths of an inch in width at the mouth. They are of a pleasing lavender shade, and appear very freely in winter. This plant was formerly known as *Goldfussia isophylla*, and it is also occasionally referred to under the generic name, Ruellia, an allied genus.

These three plants can be grown to full perfection very readily—a quality which renders them fit subjects for amateurs—and the directions for the propagation and culture of one will suffice for all. It is advisable to propagate annually in order to obtain the most decorative specimens. The tips of the young branches, in the form of cuttings, root quickly in heat at any season of the year. But it is best to propagate in spring, so that the plants may have a proper season of growth previous to the flowering period. Transfer the plants to pots singly when thoroughly rooted; grow them on in pots until the weather becomes sufficiently warm to permit of their being hardened off, and plant them in the open garden early in June. With a free supply of water during prolonged terms of drought they will thrive luxuriantly in ordinary garden soil. They must, however, be taken up not later than the latter part of August and potted, using a compost of rich loam and leaf-mould, with a small percentage of sand. They may remain outside, taking care to give them a shady position and plenty of water for a few days after potting, until about the middle of September, when they should be placed in a cool greenhouse. Increase the temperature of the house gradually as the weather grows colder, until it reaches the intermediate limit, and maintain a tolerably dry atmosphere when the plants are in bloom.

Cambridge, Mass. *M. Barker.*

New Hardy Herbaceous Plants.—Of late some splendid novelties in this class of plants of Asiatic origin have been added to my collection. *Arnebia macrothyrsa* much resembles *A. echioides*, but the individual flowers as well as the cluster (thyrsus) are much larger, the latter having often a diameter of nearly a foot and consisting of some forty golden yellow flowers. *Onosma albo-roseum*, a low herb with numerous gray, hairy, lanceolate leaves and hundreds of bell-shaped flowers, is a very striking plant. The flowers resemble those of a Corea or a *Brodiæa coccinea*, and when opening are white, changing through every shade of rose and red to become finally blood-red. *Papaver glaucum* is also a splendid novelty, bearing numerous large flowers of a dazzling crimson, the sepals forming a regular pouch, which only opens in bright sunshine. Another Poppy not yet named has numerous comparatively small minium-red flowers, which are remarkable because some twenty-five of them are united in an umbel. *Tchihatchefia isatidea* is a plant whose flower-spike rises from a rosette of hairy, dark green leaves, and shows a compact spike thickly set with numerous purple flowers. Some showy species among hardy bulbous plants are growing here, but of these I must report when more ample material is before me.

Baden-Baden. *Max Leichtlin.*

Chrysanthemums.—Success with these flowers depends upon care given to the stock-plants during winter as much as upon after-treatment. It is essential that cuttings should have a good constitution to start with. Last year I kept my stock-plants in the Violet pit, and was convinced that a light, airy, dry and cool place just suited them. This year I am growing Carnations in the Violet pit, which requires to be kept at a temperature too high for Chrysanthemums. I had perforce to prepare fresh quarters, and this I did by partitioning off a part of a deep pit and putting a false bottom in it, which I barely kept frost-proof. The plants made no growth until I took them into the greenhouse about a fortnight ago. I can now get good, strong, healthy cuttings, the rest apparently having imparted vigor to them. The plants are rooted with a little bottom heat, although this is not essential; but cool air overhead is important, so that a drawn or unnatural growth is prevented.

Wellesley, Mass. *T. D. H.*

Nematodes Attacking Bouvardias.—Spots of a dead brown are developing on the leaves of Bouvardias in the greenhouses near New York, and these are followed by a wilting and drooping of the whole plant. Microscopic examination of these lifeless spots reveals no Fungus, but multitudes of minute worms. In one greenhouse examined I observed that the white sorts of Bouvardias had escaped entirely, while the pink varieties growing with them were badly affected. This may be only accidental, that is, not a peculiarity of the varieties, but due possibly to the fact that the white sorts came from one soil and the pink ones from another. Coleus plants were usually associated with the Bouvardias examined. The leaves of these were also blotched, and in the browned spots nematodes were abundant. The fact that the Coleus is subject to attacks from these eel-worms was stated in GARDEN AND FOREST some months ago, but I have not seen the Bouvardia mentioned among the list of plants infested by them.

Rutgers College. *Byron D. Halsted.*

Correspondence.

Notes from Brookline.

To the Editor of GARDEN AND FOREST:

Sir.—In going through greenhouses attached to old places around Boston, it is interesting to note the large number of tender and half-hardy specimens of evergreen plants stored away for use in the summer on lawns and in flower-gardens and other appropriate places. During a recent visit to the greenhouses of J. L. Gardiner, Esq., among plants kept for such purposes I noted fine examples of *Myrtus Ugni*, the variegated *Eurya Japonica latifolia* and *Coprosma Baueriana*, *Ficus acuminata*, together with Grevilleas, and some of the hardier Palms, like *Phœnix reclinata*, *Livistona humilis* and *Chamærops excelsa*. Stored away in pits, or what might be termed sunken greenhouses, were found plants which are hardy in England and the south of Europe, such as Hollies, Japanese Evonymus, Caucasus Laurels, Portugal Laurels and Yews. These pits are also used for storing Indian Azaleas, Cytisus, Boronias, and many other hard-wooded plants. As the conditions of temperature are nearly uniform, there is very little to excite the plants into growth before spring, and for this reason they are much better adapted to this purpose than structures above ground. It was gratifying to note some uncommon hard-wooded plants for the culture of which Mr. Atkinson has a well-deserved reputation. Although it is generally conceded that Heaths will not endure our dry and torrid summers, yet here we find excellent home-propagated and home-grown plants of *Erica hyemalis*, *E. Wilmoriana*, *E. melanthera*, and the easier grown, yet elegant, *E. gracilis* and *E. codonoides*.

Special attention has lately been paid to *Boronia megastigma*, which forms an elegant little bush, although it is chiefly valued on account of the agreeable perfume of the flowers. Last season Mr. Atkinson planted them out, and for this purpose a number were cut back rather severely. They made strong, clean growths, far healthier than those kept in pots, and now are blooming equally well. *B. heterophylla* is probably a little more attractive than the preceding, but as it possesses scarcely any perfume, it is not so desirable.

Eriostemons are Australian plants which have been grown here many years and deserve more general culture. There are several species in gardens, all making neat bushes, and flowering freely with ordinary attention in a cool-house during winter. The flowers are borne solitary, as in *E. buxifolium*, or in twos or threes in the axils of the leaves, as in *E. myroporoides*, which is the species here grown. They are pink or white in color, with a profusion of stamens and unanthered filaments, giving the flowers a tassel-like appearance. These plants are grown in a composition of peat and loam in pots, well drained. During summer they are placed in a somewhat shady place until autumn, when they are removed to one more sunny in order to get the growth ripe and buds well set.

The advent of the beautiful hybrid Hippeastrums several years ago has not altogether displaced the humbler, yet lovely, Vallotas and Nerines. I noted in a cool-house another and uncommon South African bulbous plant, *Veltheimia viridiflora*, having dense spikes, about one foot high, of small, tubular, red, yellow and green flowers.

The roof of the Water Lily house is covered with some interesting and beautiful climbers, two of which are American plants. The Cherokee Rose is not yet in flower, although the buds were visible all over the roof. The roots are outside, the plant being trained through the wall. In bloom now, also, is *Gelsimium sempervirens*. This is a lovely, sweet-scented climber—the Yellow Jasmine of the South—and one which ought to be grown wherever a suitable position can be found for it. The flowers are sulphur yellow, funnel-shaped, about one inch long and half an inch in diameter, borne on short pedicels, two to three in the axils of the leaves,

and when trained as it should be, it is really beautiful with its festoons of flowers. In the tropical plant house was a plant of the exceedingly bright and showy *Ipomœa Horsfalliæ*, evidently grafted on the tubers of some other species, probably the Sweet Potato, *I. Batatas*. *I. Jalapa* was a species of great interest to the late Dr. Thurber, of Passaic, New Jersey, chiefly, I believe, on account of associations. This is a lovely plant when grown where it can mature sufficiently early in the season to bloom before frost. We planted every spring and stored the tubers in the fall, but it seldom bloomed until frost came to blight it. *Toxicophlæa spectabilis* I found, and large specimens well bloomed are really beautiful. The flowers are borne in umbellate corymbs, clear white in color and powerfully scented. Here, also, I saw some admirable Poinsettias. They were very vigorous, some having made growths of between five and six feet during the last season, with a spread of bracts measuring twelve to nineteen inches in diameter. The secret of taking vigorous shoots in July and August and rooting them without losing any foliage to speak of does not seem to have been discovered here. I have seen it done, however, and nothing is more striking than a group of Poinsettias, the foremost plants of which are not more than eighteen inches high, with leaves right down to the pots, which are often not more than five inches in diameter, with heads of bracts six to eight inches across.

Among Orchids particularly noteworthy were large specimens of *Phajus grandifolius*, always well done here. This is a magnificent plant, the spikes of bloom measuring three feet high, and as many as twelve to fifteen in a twelve-inch pot. Of the handsome *Cattleya Percivaliana* there were some fine varieties. The deep color of the flowers is conspicuous, and especially the orange-yellow of the interior of the labellum. There was also a deeply colored form of *Lælia autumnalis*, with good specimens of *Cypripedium insigne*, *Odontoglossum Rosii majus* and many more Orchids.

Wellesley, Mass. *H. G.*

Meetings of Societies.

The Western New York Horticultural Society.—I.

THE thirty-sixth annual convention of this body, which took place at Rochester last week, was one of the largest and most successful ever held, notwithstanding the fact that last year was one of very general failure in the fruit crop. Mr. S. D. Willard, the first Vice-President of the Society, in his annual address alluded to the general disaster which befel orchards and vineyards, and yet he spoke hopefully, and called attention to the fact that fruit-growers were more thoroughly equipped to-day than ever to meet with the trials which come from bad seasons and the attacks of insects and diseases, and he predicted that the era of low prices was about to give place to more prosperous times. Mr. Willard spoke with feeling of the late President, Mr. Patrick Barry, and noticed the death of two or three other prominent members of the Society which had occurred during the year. Two hundred and eighty subscriptions for membership were made, and, although there were no prizes offered, an admirable display of fruit, especially pears, apples and grapes, was made. The officers appointed for the following year were: President, W. C. Barry; Vice-Presidents, S. D. Willard, W. Brown Smith, J. S. Woodward and George A. Sweet; Secretary and Treasurer, John Hall.

As usual, the addresses and discussions were practical and pointed, and the reports of the various county committees were full of instruction. Abstracts of some of the more important papers are given below:

DO VARIETIES RUN OUT?

This was the subject of a paper by Professor Bailey, which we reproduce entire:

"Few questions have occasioned more discussion than this, and few have been so imperfectly answered. At the present time there are the most diverse opinions concerning it, but with a strong trend toward the negative side; and yet the affirmative of the question admits of almost mathematical demonstration.

"If we define our propositions we shall see immediately that two or three separate questions have been mixed up in this discussion. By "running out" is meant the disappearance of the characteristics of any variety. It does not mean that the line of succession, the series of generations, actually becomes extinct, but that the sum of attributes by which we are able to identify the group of individuals has become so modified that we no longer recognize it. Running out, therefore, is not necessarily deterioration, although the two are commonly confounded; it is simply change, modification. If we say that the Peachblow potato, for instance, has run out, we simply mean that it has disappeared. It has broken up into many forms, perhaps. We cannot say that it has degenerated, for degeneracy is a relative term, and a variety or an individual which is inferior for one purpose may still be superior for some other; and it is probable that there are many different grades or kinds of variations in the remnants of the variety, some poor, some good.

"Again, running out does not mean that the life of the variety is necessarily limited in duration. As a matter of philosophy, we are safe in assuming that the duration of any particular form of life is prelimited, for there is evidence that species have become extinct. Yet, as a matter of practice, the limits of the genetic duration of species and varieties in nature concern us little; and, at any rate, there is no reason to suppose that varieties possess necessarily a different limitation from species. The presumption is, however, as Dr. Gray long ago pointed out,* that the older the variety, that is, the greater the number of its generations, the greater must be its chances of permanence, because it has become pronounced in its character and has proved its capability to persist. But I propose to limit the present discussion to the mere disappearance of varietal characteristics by which we lose sight of the variety, rather than to extend it to the philosophical question as to whether varieties, like individuals, become old and die or wear out.

"My proposition and the proof of it are simply these: Running out is the disappearance of varietal characteristics through change; all plants vary or change, therefore varieties must tend to run out. While there can be no doubt of this general fact or law, there are still degrees of running out, because no two plants vary in the same way or at the same rate—that is, as there are diverse kinds of variation so there must be diverse kinds of running out. The causes of running out are therefore as numerous as the causes of plant variation, and they include all such considerations as the influences of soils, climates, methods of culture, attacks of fungi and insects. It is necessary, however, to distinguish from this the disappearance of varieties through mere fashion, which often banishes varieties which are in every way well marked.

"We can divide variation into two general groups, seed variation and bud variation. Seed variation may be called a progressive tendency, because the new forms or variations are generally different from their ancestors, and possess a greater or less tendency to perpetuate themselves. The seed grower is obliged to exercise constant vigilance to keep his stock "true." He knows that, as a rule, stock is more likely to remain true on poor soils than on very rich ones, because on the latter it tends to sport or "break" more. Dwarf peas soon become half dwarfs upon strong soils, and they possess a tendency to perpetuate their characteristics. These are instances in which soils cause running out. Climate exerts wonderful effect upon vegetation. Transfer northwards dwarfs plants and induces co-ordinate changes. Dent Corn, taken far north, after a time becomes flint, as has been shown by the experiments of Beal and others. And Beal observes† that in southern Michigan Dent "ears grow shorter, kernels become shorter and rounder at the ends." Some plants possess a strong tendency toward variation which appears to be in a measure independent of surroundings. The tomato is a good example; varieties do not long retain their original characters. It is probably impossible to find in the market to-day the Tilden tomato as it was known when the variety first appeared. And the Trophy has changed considerably from its original self. In short, the very fact that we can improve varieties by good culture and that we are enabled to obtain new varieties at all, is indubitable proof that varieties run out. Upon this fact depends all possibility of advance in the origination of varieties, and upon this general law, also, hangs the whole framework of evolution.

"Bud variation comprises all change which comes through the agency of grafts, cuttings and tubers. By grafting or cutting we simply multiply the original plant—we do not take offspring from it—and we have every reason to expect, what all observation shows, that propagation by buds should give a

* *New York Tribune*, Dec. 8th, 1874. Reprinted in the *American Journal of Science and Arts*, and Sargent's "Scientific Papers of Asa Gray."

† Rep. Mich. Bd. Agr., 1876, 113.

less variable result than propagation by seeds. And yet there are instances in which plants do not come true from cuttings or grafts. As a philosophical question, the presumption is that varieties propagated by buds wear out sooner than those propagated by seeds, for the experiments of Darwin and others have shown that the special office of seed propagation is to increase the vitality of the species through cross fertilization. It must follow, therefore, that in the absence of cross fertilization vitality must be less.*

"But as a matter of practice we do not need to consider this phase of the question, for we are concerned with variation rather than with ultimate longevity. And it is also probable that any tendency toward weakness through lack of fertilization is fully counterbalanced by protection which such varieties receive under cultivation.

"The question comes simply to this: If buds are taken from parts which possess stable characteristics they will give stable products under similar conditions. But if the buds are taken from parts which have been developed into abnormal conditions, and which tend to vary, they must tend strongly to depart from the parent, especially when the means by which the high development was produced and is maintained are removed. Bud variation may therefore be said to be indeterminate. The best example of running out in plants propagated by buds is the potato. It is a matter of general observation that varieties of potatoes disappear. And Beal† has performed experiments which show that in eight years varieties which gave good crops so far ran out as to produce nothing. These varieties were grown in the same garden throughout the experiment, but they were constantly shifted over an area of from five to eight acres, so that potatoes were not grown two seasons upon exactly the same ground. And during the time when these potatoes were decreasing in yield the garden was each year producing better crops of other kinds, and the newer varieties of potatoes did well. In this case it may be argued that the plants showed signs of wearing out rather than running out by variation, but there is no evidence to show that the plants were in any way weaker or less able to perpetuate themselves after they had run out than before, for it is probable that seed production increased as tuber production decreased. At all events, we cannot determine if the varieties wore out, so long as we have no record of their seed production. It seems, rather, that the plants returned to a comparatively tuberless condition. Large Potato-tubers are abnormal to begin with, and it is not strange if their characters are transitory.

"At present I see no reason for supposing that fruits propagated by buds run out so long as equal conditions of culture and soil fertility exist; but if the buds were to be taken from parts which are abnormally or unusually developed, as they are in the potato, I should expect that we could not long hold the offspring to their assumed character.

"The conclusion of the whole matter is simply this: Varieties grown from seeds tend to vary or run out. Varieties grown from buds tend to remain permanent, or nearly so, unless the parts which are propagated possess abnormal, or what we might call fictitious or unstable, characters, in which case further variation or running out may be expected."

BACTERIA AND GREEN MANURING.

Professor Caldwell delivered an unusually instructive address on this subject. About four-fifths of any crop plowed under is water; one-fiftieth of it, or what would remain after burning, is called ash, and the rest is organic matter which mostly comes from the air. There are twelve pounds of this in every hundred of the crop turned under, and this addition to the soil improves it in many ways. In the first place, it adds humus, which makes the soil more porous and warmer, and is a constant source of carbonic acid, which does good work in making soluble the food already in the soil. Besides this, it has been clearly demonstrated by recent research that organic matter in some kinds of plants contains much nitrogen, the costliest of plant foods, which it has gathered from the air. The crops which are known to have this faculty are Clover, Peas and other leguminous plants. On the roots of these plants are nodules formed by bacteria, and somehow, in the formation of these swellings, the free nitrogen of the air in the pores of the soil is taken up by the plant. It has been proved that Peas or Lupins will grow in sand which is entirely free from nitrogenous food of any kind if there is only added to the sand a sufficient quantity of the other constituents of plant food with some of the bacteria to secure the nitrogen. Professor Caldwell concludes as follows:

"But the bacteria have still another part to play in the preparation of green manure in order to convert it into assimilable food for the following crop. Green vegetable matter is not food for plants. It must first undergo decay, or, to use a less elegant phrase, it must rot. Now another set of bacteria come in here and carry on this work of decay. They live and multiply in the green vegetable matter, and in connection with their life and growth this matter is converted into humus. There is still another valuable piece of work done by the bacteria besides making the humus, which is the conversion of the nitrogen into nitric acid, or the very important process of nitrification.

"For the best results, then, in green manuring, take for your crop some leguminous plant, such as Pea, Bean, Vetch, Clover, Lupin, Alsike, or others, and select the one that will give you the largest quantity of green matter before the middle of August at the latest. Have your soil well drained and fertilize it well with phosphate and potash, buying no fertilizer that is claimed to contain any nitrogen. For if such a claim is made you have to pay more for manure on that account, and one of the objects of your green manuring is to get your nitrogen for nothing. Plow the crop in even by the 1st of August if you have the ground well covered with a luxuriant growth by that time. Avoid plowing it in deep, and, if practicable, loosen up the ground before the cool weather sets in. This is just the sort of treatment required for putting in a grain crop. Soon after this crop is turned in the bacteria will begin their arduous labors of humufication and nitrification.

"Finally, let me give an account from one of the German journals of the successful use of green manuring in a vineyard. On a German experimental vineyard thirty-five pounds of clover-seed (*Trifolium incarnatum*) were sown per acre, with Thomas' phosphate added for mineral fertilizer. The roots of the plants from a small plat were carefully taken up, and found to be well covered with tubercles. The gain in nitrogen was estimated to be about 118 pounds to the acre. This would have required 20,000 to 25,000 pounds of stable manure for the same quantity of nitrogen. The whole cost of this crop was about 126 marks, while the cost of the stable manure to accomplish an equal result would have been 200 to 300 marks."

DISEASES OF THE GRAPE IN WESTERN NEW YORK.

A carefully prepared paper on this subject was made by David G. Fairchild, of the Department of Vegetable Pathology at Washington. What he said in reference to the various mildews, rots and anthracnose, with their remedies, it is not necessary here to repeat. These matters have been already treated in this journal. We present, however, some facts in reference to a new disease of the grape, which may prove a serious matter in our vineyards:

"About the 1st of September, 1890, complaints reached the Department from numerous localities through western New York of a disease which was threatening the grape in that region. Specimens were received from various parties, and, although carefully examined, revealed no parasites upon them. Accordingly, although so late in the season that many of the vineyards had been touched by the frost, an examination was made of numerous vines in different localities through the infected region, and notes taken of the varying conditions under which the disease appeared. From a study of the trouble in October the following diagnosis may be made: The leaves first show the disease manifesting at the outset irregular, somewhat star-like red blotches between the veins, which gradually enlarge and run together, at the same time becoming browner until they fill up the spaces between the main veins with a deep red-brown tissue, giving to the leaf a pronouncedly striped appearance. This striped look is quite characteristic and may often be seen from a distance of several rods. Upon those vines diseased the berries are of an insipid flavor, often intensely sour, and drop from their stems in the later stages on the slightest touch. Badly diseased veins may often be distinguished by the layer of shriveled berries covering the earth beneath them.

"The trouble is not entirely confined to cold, heavy soils, although apparently worse upon such land, nor is it connected, so far as can be ascertained, with the use or absence of any fertilizers. The shade which is afforded by the foliage of trees and by houses, although in one or two cases seeming to afford protection, cannot be surely connected with it. Examinations of the roots of many diseased and healthy plants, while revealing the fact that the young fibrils had almost entirely rotted away in the diseased ones and were only partially decayed upon the healthy ones, have shown no parasite of a nature adequate to cause the injury. In some respects the disease resembles that which lately appeared in California and threatened the grape interest of that state, and until one or both are more fully worked out must stand in the same general category.

* See also Gray, *l. c.*
† Rep. Mich. Bd. Agr., 1876, 111.

"Comparing it with the descriptions of the French malady known as Rougeot, it is found to possess many points of resemblance, and the eminent French viticulturist Viala, who noticed this disease in his recent journey in the United States, thought that it was probably the same. In the judgment of this authority, Rougeot follows as a concomitant a sudden lowering of the temperature in mid-summer when the vines, loaded with fruit, are in full growth, and is much more likely to occur upon heavy, ill-drained soils than upon light, well-drained land. Both Viala and Foix recommend as the surest prevention against its attacks thorough underdraining. If the wood has failed to mature, and enough bearing wood cannot be secured to furnish good healthy canes, the wisest plan will be to prune close to the ground and raise an entirely new growth.

"Although considerable time and attention has been paid to the class of diseases to which this new malady probably belongs, the prime cause is not positively known, and until a longer time for experimental research is afforded the trouble must remain only partially explained."

Notes.

The fifth annual Orchid show of Messrs. Siebrecht & Wadley will open on the 4th of March at Madison Square Garden.

An exhibition of Orchids will be held at the nurseries of Messrs. Pitcher & Manda, Short Hills, New Jersey, from the 9th to the 14th of February.

A German journal reports that a horticultural establishment in Brussels has already received "much more than $20,000 from the sale of plants of the recently introduced *Cattleya Warocqueana*."

Gartenflora reports that *Pachystima Canbyi*, a rare shrub of the southern Alleghany Mountains, is in cultivation in the public gardens at Münden, in Germany, and endures the winter weather well, although it makes growth very slowly.

The first greenhouse in Chicago was, says the *Prairie Farmer*, erected by one Samuel Brooks in 1840. It was a lean-to structure about fifty feet long by twelve feet wide. Part of the house is yet standing in that city. Perhaps the Chicagoans will place it on exhibition at the World's Fair.

Statistics prove that the horses of England haul on an average twice as much as American horses. This is not due to the superiority of English horses, but of English roads. We cannot afford to build good roads, it is said, but we are compelled by this failure to keep two horses to do the work which should be done by one.

Mr. Frank Hinckley, who recently died at his home in Old San Bernardino, first went to California as an engineer, but of recent years had been one of the most successful horticulturists in the southern part of the state. It is said that his father, in the year 1846, brought to California the first fruit-trees ever imported from the east.

The favorite flower of Mohammed was the Narcissus, probably the yellow Daffodil, which grows abundantly all through western Asia, and he gave his followers the following counsel: "Whoever has two loaves of bread, let him trade one for a blossom of Narcissus; for bread is nourishment for the body, but the Narcissus is food for the soul."

It is estimated that by careful cultivation almost one-fourth of all the cultivated land in China is made to bear two crops a year, while many portions produce three crops. The utmost ingenuity and economy are displayed in the use of manures, even the burnt fire-crackers which are left from the frequent festivals being strewn on the fields for the sake of their nitrogenous elements.

A western paper recently described a curious example of the natural "in-arching" of trees in Lawrence County, Illinois. The trunks of two Elm-trees, standing about twenty feet apart, have met at about the same distance above the ground, where they blend into a perfectly symmetrical trunk of large dimensions. The tree is nearly a hundred feet in height and very well developed, and wagons can, of course, easily be driven through the great triangle which forms its base.

Experiments reported by Professor Maynard, of the Massachusetts Agricultural College, give renewed testimony of the effectiveness of the Bordeaux Mixture as a preventive of mildew and black rot of the grape. Paris green added to the Bordeaux Mixture, even to the amount of one pound to 200 gallons, did no injury to either leaves or branches of Plum-trees, and, in the opinion of Professor Maynard, when used in the form of spray it will hold in check the curculio and the destructive black wart.

The Ministry of Imperial Property in Russia recently issued the following edicts: "1. Forests shall not be cut throughout, but in small portions at a time. 2. When a part of a forest is cut the ground shall immediately be cleared of the rubbish and fenced in so that no cattle can graze there. 3. Shepherds are forbidden, under a heavy penalty, to build fires either in the woods or within the limits of a forest in spots that have been cleared of trees."

At a recent meeting of the Society for Horticulture and Botany at Cologne one of the members highly recommended cellulose paper as a covering for plants which are left outdoors in winter, and especially for Roses. "This paper," says a report of his words in *Gartenflora*, "has been tried in the Public Garden of Cologne, and perfectly resisted the action of cold, snow and rain. Plants covered with it have remained uninjured in the very coldest winters."

In a recently published paper Professor S. Coulter says that the forest-area of Indiana has been reduced to 2,000,000 acres, about one-tenth of the total extent of the state, although it is still the fifth state in the Union as a producer of lumber. In Professor Coulter's belief, the distribution of forest-trees within the limited area of Indiana is but little influenced by geological differences, the main influences being elevation, the location of swamps and the course of rivers and streams. The most generally distributed tree of the 106 species that are indigenous to the state is Sugar Maple, which is found in every county.

In an article on plant legends, recently published in the *Deutsche Rundschau*, Dr. Von Langegg says that there is as much uncertainty with regard to the true meaning of the Biblical "Lily-of-the-Field" as with regard to that of "Rose of Sharon." Many persons have believed it to be *Tulipa Gesneriana*, which grows abundantly to the westward of the Sea of Genneserath, while others have found it in the yellow Daffodil, so common in many parts of Palestine. Later travelers say that it is *Lilium Chalcedonicum* or the red *L. Martagon*, which was formerly called the Byzantine Lily, and is especially abundant about Galilee, while still others speak for the purple flower of *Cynara Scolymus*, the wild Artichoke. The monks of the middle ages believed the Chalcedony Lily to be the true "Lily-of-the-Field," and hence introduced it into Europe and cultivated it largely, as the typical flower of the Virgin, in their convent gardens.

A correspondent of *Gartenflora* writes of a recent Chrysanthemum exhibition at Leipsic: "A well-developed specimen of Mrs. Alpheus Hardy was shown and must have pleased every expert. The downy covering was, indeed, not so prominent as to justify a comparison with a 'head of curls,' nevertheless it was downy. For myself, I am not enthusiastic with regard either to this or to the newer Louis Boehmer with reddish hairs, which comes from Peter Henderson in New York. It is not probable that either will reach commercial importance, for Mrs. Hardy is a lazy bloomer and so delicate that it is of little use for transport." To this the editors of the journal add: "We saw Mrs. Hardy at the end of November in Charlottenburg, but little of its lauded beauty was descernible; the flowers were not well developed." From this it appears that we have succeeded better with these famous varieties than have German horticulturists.

There is much truth in the following words which we quote from an article recently published in the New York *Tribune*: "Conservatories are much more frequently seen in England than in this country. Over here they are seldom met with even in houses of decided pretensions, and never, or hardly ever, in an ordinary dwelling. In London, however, almost every suburban house has its little greenhouse full of lovely bloom, opening invariably into the dining-room or drawing-room, . . . and it is really a pretty sight, that of a liveable English drawing-room, with its air of indescribable comfort and its glimpse through the half-opened door of the conservatory. . . . Whether it is the climate or the greater care taken, or because they are more genuinely loved than in this country, flowers certainly seem to thrive better in England, under amateur management, than in America. We suspect it is the latter reason. Americans do more for effect than the English; their flowers are decorations instead of dearly loved companions. These little conservatories, in ordinary well-to-do-families, are generally the charge of one of the daughters of the house, who daily cares for the delicate plants with undeviating regularity."

"THERE IS NO APPEAL BEYOND CÆSAR"

The Late World-Renowned Dermatologist,

Sir ERASMUS WILSON, F.R.S.,

THE FIRST AND ONLY

President of the Royal College of Surgeons

Who ever gave a public testimonial, and the following is

THE ONLY TESTIMONIAL HE EVER GAVE

"If it be well to wash the skin—and we never heard the proposition questioned—it is well also that we should be familiar with the means by which that purpose may be most efficiently attained.

"We once knew a beautiful woman, with a nice complexion, who had never washed her face with soap all her life through; her means of polishing were, a smear of grease or cold cream; then a wipe, and then a lick with rose water. Of course we did not care to look too closely after such an avowal, but we pitied her, **for soap is the food of the skin.**

Soap is to the Skin What Wine is to the Stomach,

a generous stimulant. It not only removes the dirt, but the layer which carries the dirt; and it promotes the displacement of the old cuticle to make way for the new, to increase the activity of change in the skin. Now turn we to Toilet Soaps and there we find

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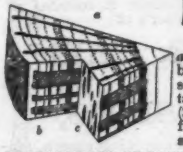

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